



# Semigroups of Operators: Theory and Applications

Conference Schedule

Bedlewo, Poland, October 6 — 11, 2013

# Conference schedule

## Monday

8<sup>00</sup> Breakfast

9<sup>00</sup> Conference opening

9<sup>05</sup> Plenary talk: Charles Batty

10<sup>00</sup> Coffee break

10<sup>30</sup> Morning sessions

	T. Byczkowski and K. Bogdan		J. Voigt
10 <sup>20</sup> –10 <sup>45</sup>	Tomasz Byczkowski	10 <sup>20</sup> –10 <sup>45</sup>	Frank Neubrandner
10 <sup>50</sup> –11 <sup>15</sup>	Tomasz Jakubowski	10 <sup>50</sup> –11 <sup>15</sup>	Sebastian Król
11 <sup>20</sup> –11 <sup>45</sup>	Jacek Dziubański	11 <sup>20</sup> –11 <sup>45</sup>	Alyona Zamyshlyeva
11 <sup>50</sup> –12 <sup>15</sup>	Stanislav Stepin	11 <sup>50</sup> –12 <sup>15</sup>	Roland Schnaubelt
12 <sup>20</sup> –12 <sup>45</sup>	Alexander Bendikov	12 <sup>20</sup> –12 <sup>45</sup>	Josef Kreulich
12 <sup>50</sup> –13 <sup>15</sup>	Bartosz Trojan	12 <sup>50</sup> –13 <sup>15</sup>	Wolfgang Ruess

13<sup>15</sup> Lunch

15<sup>00</sup> Afternoon sessions (part 1):

	Y. Tomilov		A. Peris
15 <sup>00</sup> –15 <sup>30</sup>	Ralph Chill	15 <sup>00</sup> –15 <sup>30</sup>	José Bonet
15 <sup>30</sup> –16 <sup>00</sup>	David Seifert	15 <sup>30</sup> –16 <sup>00</sup>	Elisabetta Mangino
16 <sup>00</sup> –16 <sup>30</sup>	Tomasz Szarek	16 <sup>00</sup> –16 <sup>30</sup>	Alfred Peris

16<sup>30</sup> Coffee break

17<sup>00</sup> Afternoon sessions (part 2):

	Y. Tomilov		A. Peris
17 <sup>00</sup> –17 <sup>30</sup>	Piotr Rybka	17 <sup>00</sup> –17 <sup>30</sup>	Marcin Moszyński
17 <sup>30</sup> –18 <sup>00</sup>	Ernest Nieznaj	17 <sup>30</sup> –18 <sup>00</sup>	Félix Martínez-Giménez

18<sup>30</sup> Dinner (barbecue)<sup>1</sup>

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<sup>1</sup>If weather allows: otherwise barbecue will be arranged Tuesday

**Tuesday**8<sup>00</sup> Breakfast9<sup>00</sup> Plenary talk: Wolfgang Arendt10<sup>00</sup> Coffee break10<sup>30</sup> Morning sessions

	T. Byczkowski and K. Bogdan		J. Voigt
10 <sup>20</sup> –10 <sup>55</sup>	Jan Kisiński	10 <sup>30</sup> –10 <sup>55</sup>	András Bátkai
11 <sup>00</sup> –11 <sup>25</sup>	Agnieszka Kałamajska	10 <sup>55</sup> –11 <sup>20</sup>	Hendrik Vogt
11 <sup>30</sup> –11 <sup>55</sup>	Tomasz Grzywny	11 <sup>20</sup> –11 <sup>45</sup>	Chin Pin Wong
12 <sup>00</sup> –12 <sup>25</sup>	Victoria Knopova	11 <sup>45</sup> –12 <sup>10</sup>	Isabelle Chalendar
12 <sup>30</sup> –12 <sup>55</sup>	Bartłomiej Dyda	12 <sup>10</sup> –12 <sup>35</sup>	Bálint Farkas
12 <sup>55</sup> –13 <sup>20</sup>	Dominika Pilarczyk	12 <sup>35</sup> –13 <sup>00</sup>	Jürgen Voigt

13<sup>15</sup> Lunch15<sup>00</sup> Afternoon sessions (part 1):

	Y. Tomilov		J. Banasiak
15 <sup>00</sup> –15 <sup>30</sup>	Charles Batty	15 <sup>00</sup> –15 <sup>30</sup>	Jerome Goldstein
15 <sup>30</sup> –16 <sup>00</sup>	Roland Schnaubelt	15 <sup>30</sup> –15 <sup>50</sup>	Valentina Parfenenkova
16 <sup>00</sup> –16 <sup>30</sup>	Markus Haase	15 <sup>50</sup> –16 <sup>10</sup>	Sophiya Zagrebina
		16 <sup>10</sup> –16 <sup>30</sup>	Henryk Leszczyński

16<sup>30</sup> Coffee break17<sup>00</sup> Afternoon sessions (part 2):

	Y. Tomilov		J. Banasiak
17 <sup>00</sup> –17 <sup>30</sup>	Andrzej Palczewski	17 <sup>00</sup> –17 <sup>20</sup>	Rodrigue Yves M'pika Massoukou
17 <sup>30</sup> –18 <sup>00</sup>	Lassi Paunonen	17 <sup>20</sup> –17 <sup>40</sup>	Georgy Sviridyuk
		17 <sup>40</sup> –18 <sup>00</sup>	Jacek Banasiak

18<sup>15</sup> Dinner

**Wednesday**7<sup>30</sup> Breakfast8<sup>30</sup> Plenary talk: Roberto Triggiani9<sup>30</sup> Coffee break9<sup>50</sup> Morning sessions

	I. Lasiecka, R. Triggiani, J. Zabczyk		A. Bobrowski
9 <sup>50</sup> –10 <sup>15</sup>	Jerzy Zabczyk	9 <sup>50</sup> –10 <sup>15</sup>	Markus Haase
10 <sup>20</sup> –10 <sup>45</sup>	George Avalos	10 <sup>20</sup> –10 <sup>45</sup>	Sebastian Król
10 <sup>50</sup> –11 <sup>15</sup>	Natalia Manakova	10 <sup>50</sup> –11 <sup>15</sup>	Delio Mugnolo
11 <sup>20</sup> –11 <sup>45</sup>	Irena Lasiecka	11 <sup>20</sup> –11 <sup>45</sup>	Adam Gregosiewicz

11<sup>55</sup> Lunch12<sup>30</sup> Sightseeing18<sup>30</sup> Dinner

**Thursday**8<sup>00</sup> Breakfast9<sup>00</sup> Plenary talk: Krzysztof Bogdan10<sup>00</sup> Coffee break10<sup>30</sup> Morning sessions

A. Rhandi		J. Janas	
10 <sup>30</sup> –11 <sup>00</sup>	Giorgio Metafune	10 <sup>30</sup> –10 <sup>55</sup>	Vladimir Müller
11 <sup>00</sup> –11 <sup>30</sup>	Chiara Spina	10 <sup>55</sup> –11 <sup>20</sup>	Marek Ptak
11 <sup>30</sup> –12 <sup>00</sup>	Cristian Tacelli	11 <sup>20</sup> –11 <sup>45</sup>	Zbigniew Burdak
12 <sup>00</sup> –12 <sup>30</sup>	Natalia Ivanova	11 <sup>45</sup> –12 <sup>10</sup>	Artur Płaneta
12 <sup>30</sup> –13 <sup>00</sup>	Fatima Boudchich	12 <sup>10</sup> –12 <sup>35</sup>	Joanna Blicharz
		12 <sup>35</sup> –13 <sup>00</sup>	Elżbieta Król

13<sup>15</sup> Lunch15<sup>00</sup> Afternoon sessions (part 1):

A. Rhandi		J. Banasiak	
15 <sup>00</sup> –15 <sup>30</sup>	Simona Fornaro	15 <sup>00</sup> –15 <sup>30</sup>	Mustapha Mokhtar-Kharroubi
15 <sup>30</sup> –16 <sup>00</sup>	Dominik Dier	15 <sup>30</sup> –15 <sup>50</sup>	Marcin Małogrosz
16 <sup>00</sup> –16 <sup>30</sup>	Marjeta Kramar Fijavž	15 <sup>50</sup> –16 <sup>10</sup>	Minzilia Sagadeeva
		16 <sup>10</sup> –16 <sup>30</sup>	Wilson Lamb

16<sup>30</sup> Coffee break17<sup>00</sup> Afternoon sessions (part 2):

A. Rhandi		J. Banasiak	
17 <sup>00</sup> –17 <sup>20</sup>	Luca Lorenzi	17 <sup>00</sup> –17 <sup>20</sup>	Proscovia Namayanja
17 <sup>20</sup> –17 <sup>40</sup>	Luciana Angiuli	17 <sup>20</sup> –17 <sup>40</sup>	Jurij Kozicki
17 <sup>40</sup> –18 <sup>00</sup>	Waed Dada	17 <sup>40</sup> –18 <sup>00</sup>	Mirosław Lachowicz

18<sup>30</sup> Concert of Chamber Music19<sup>30</sup> Conference Dinner

**Friday**8<sup>00</sup> Breakfast9<sup>00</sup> Plenary talk: Jerome Goldstein10<sup>00</sup> Coffee break10<sup>30</sup> Morning sessions

	A. Rhandi		R. Rudnicki
10 <sup>30</sup> –11 <sup>00</sup>	Viktor Gerasimenko	10 <sup>30</sup> –11 <sup>00</sup>	Ryszard Rudnicki
11 <sup>00</sup> –11 <sup>30</sup>	Anna Karczewska	11 <sup>00</sup> –11 <sup>30</sup>	Przemysław Paździorek
11 <sup>30</sup> –12 <sup>00</sup>	Sergey Piskarev	11 <sup>30</sup> –12 <sup>00</sup>	Andrzej Tomski
12 <sup>00</sup> –12 <sup>30</sup>	Sami Mourou	12 <sup>00</sup> –12 <sup>30</sup>	Paweł Zwoleński
12 <sup>30</sup> –13 <sup>00</sup>	Abdelaziz Rhandi	12 <sup>30</sup> –13 <sup>00</sup>	Joanna Jaroszevska

13<sup>00</sup> Conference closing13<sup>15</sup> Farewell lunch14<sup>00</sup> – 15<sup>00</sup> Buses to Poznań.

# Sessions

## Plenary talks

1. Wolfgang Arendt, The Dirichlet-to Neumann operator by hidden compactness.
2. Charles Batty, Fine scales of decay of operator semigroups.
3. Krzysztof Bogdan, Perturbations of integral kernels.
4. Jerome Goldstein, Some biased remarks on the development of semigroups of operators.
5. Roberto Triggiani, Optimal polynomial decay via interplay between semigroup.

## 1. Approximation and perturbation of semigroups (J. Voigt)

1. András Bátkai, PDE approximation of large systems of differential equations.
2. Isabelle Chalendar, Lower estimates near the origin for functional calculus on operator semigroups.
3. Bálint Farkas, Operator splitting for delay equations.
4. Josef Kreulich, Asymptotic equivalence of evolution equations in Banach spaces.
5. Sebastian Król, Perturbations of generators of  $C_0$ -semigroups and resolvent decay.
6. Frank Neubrander, Laplace transform inversion and approximation of semigroups.
7. Wolfgang Ruesch, Invariant sets for semigroups of nonlinear operators.
8. Roland Schnaubelt, Splitting methods for Schrödinger equations with singular potentials.
9. Hendrik Vogt, A weak Gordon type condition for absence of eigenvalues of one-dimensional Schrödinger operators.
10. Jürgen Voigt, Perturbations for linear delay equations in  $L_p$ .
11. Chin Pin Wong, Honesty theory of positive perturbations.
12. Alyona A. Zamyshlyeva, An alternative approximation of the degenerate strongly continuous operator semigroup.

## 2. Asymptotic behaviour of semigroups (J. Tomilov)

1. Charles Batty, Quasi-hyperbolic semigroups.
2. Ralph Chill, A Katznelson-Tzafriri theorem with rates for  $C_0$ -semigroups on Hilbert spaces.
3. Markus Haase, Convergence rates in the mean ergodic theorem for semigroups.
4. Ernest Nieznaj, Asymptotic behavior of a passive tracer in random fields.
5. Andrzej Palczewski, Convergence of semigroups associated to heat propagation models.
6. Lassi Paunonen, Robustness of polynomial stability of semigroups.
7. Piotr Rybka, A global attractor of a sixth order Cahn-Hilliard type equation.
8. Roland Schnaubelt, Strong convergence in  $L^p$ -spaces for invariant measures for non-autonomous Kolmogorov equations.
9. David Seifert, Rates of decay in the classical Katznelson-Tzafriri theorem.
10. Tomasz Szarek, Ergodic measures for Markov semigroups.

## 3. Cosine operator functions (A. Bobrowski)

1. Adam Gregosiewicz, Generation of moments-preserving cosine families by Laplace operators.
2. Markus Haase, Cosine functions and functional calculus.
3. Sebastian Król, Resolvent characterisation of generators of cosine functions and  $C_0$ -semigroups.
4. Delio Mugnolo, No boundary conditions for wave equations on an interval.

## 4. Heat kernels, Green's functions and Hardy spaces (B. Bogdan, T. Byczkowski)

1. Alexander Bendikov, On the spectrum of the hierarchical Laplacian.
2. Tomasz Byczkowski, Hitting half-spaces or spheres by Ornstein-Uhlenbeck type diffusions.



3. Bartłomiej Dyda, Sufficient and necessary conditions for fractional Hardy inequality.
4. Jacek Dziubański, On isomorphisms of Hardy spaces for certain Schrödinger operators.
5. Tomasz Grzywny, Heat kernel estimates for unimodal Levy processes.
6. Tomasz Jakubowski, Fundamental solution of fractional diffusion equation with singular drift.
7. Agnieszka Kałamajska, On solutions to heat equation with the initial condition in Orlicz-Slobodetskii space.
8. Jan Kiszyński, Convolution operators as generators of one-parameter semigroups.
9. Victoria Knopova, On the parametrix solution to the Cauchy problem for some non-local operator.
10. Dominika Pilarczyk, Self-similar asymptotics of solutions to heat equation with inverse square potential.
11. Stanislav Stepin, Heat-type kernels: regularized traces and short-time asymptotics.
12. Bartosz Trojan, Heat kernel asymptotics on affine buildings.

## **5. Linear models in chaotic dynamics (A. Peris)**

1. José Bonet, Mean ergodic semigroups on Frechet spaces.
2. Elisabetta Mangino, Spectral conditions for generators of distributional chaotic semigroups.
3. Félix Martínez-Giménez, The specification property for linear operators.
4. Marcin Moszyński, Discrete analogs of the asymptotic Levinson theorem and their spectral applications for Jacobi operators.
5. Alfred Peris, Strong mixing measures for  $C_0$ -semigroups.

## **6. Semigroups for evolution equations (A. Rhandi)**

1. Luciana Angiuli, Hypercontractivity and long time behaviour in nonautonomous Kolmogorov equations.
2. Fatima Boudchich, Feedback stabilization of some functional differential equations.

3. Waed Dada, A semigroup approach to numerical ranges of operators.
4. Dominik Dier, Invariance of convex sets for non-autonomous evolution equations governed by forms.
5. Simona Fornaro, Semigroups generated by degenerate elliptic operators.
6. Viktor Gerasimenko, On the semigroups for quantum many-particle evolution equations.
7. Natalia Ivanova, Inverse problem for a degenerate evolution equation with overdetermination on the solution semigroup kernel.
8. Anna Karczewska, Resolvent operators corresponding to linear Volterra equations.
9. Marjeta Kramar Fijavž, The semigroup approach to dynamical processes in networks.
10. Luca Lorenzi, Heat kernel estimates for autonomous and nonautonomous evolution equations.
11. Giorgio Metafune, Weighted Rellich and Calderón-Zygmund inequalities in  $L^p$ .
12. Sami Mourou, Elliptic operators with complex unbounded coefficients on arbitrary domains  $L^p$ -theory and kernel estimates.
13. Sergey Piskarev, The discretization of Bitzadze-Samarsky type inverse problem for elliptic equations with Dirichlet and Neumann conditions.
14. Abdelaziz Rhandi, Kernel estimates for nonautonomous Kolmogorov equations.
15. Chiara Spina, Homogeneous Calderon-Zygmund estimates for a class of second order elliptic operators.
16. Cristian Tacelli, On Schrödinger operator with unbounded coefficients.

## **7. Semigroups in biology/Markov semigroups (R. Rudnicki)**

1. Joanna Jaroszevska, Asymptotic properties of semigroups of Markov operators and of families of Markov-type nonlinear operators.
2. Przemysław Rafał Paździorek, Long time behaviour of the stochastic model of stem cells differentiation with random switching.
3. Ryszard Rudnicki, Piece-wise deterministic processes in biological models.

4. Andrzej Tomski, The dynamics of enzyme inhibition controlled by piece-wise deterministic Markov proces.
5. Paweł Zwoleński, Phenotypic evolution of hermaphrodites.

## 8. Semigroups in natural sciences (J. Banasiak, W. Lamb)

1. Jacek Banasiak, Compactness and analyticity of fragmentation semigroups.
2. Jerome Goldstein, The deterministic PDEs of mathematical finance.
3. Jurij Kozicki, Markov evolution of a spatial logistic model: micro-and mesoscopic description.
4. Mirosław A. Lachowicz, Semigroups in biology.
5. Wilson Lamb, Discrete coagulation-fragmentation equations.
6. Henryk Leszczyński, Semigroups and the maximum principle for structured populations with diffusion.
7. Marcin Małogrosz, Dimension reduction in a model of morphogen transport.
8. Rodrigue Yves M'pika Massoukou, Asymptotic analysis of a singularly perturbed nonlinear problem.
9. Mustapha Mokhtar-Kharroubi, Trend to equilibrium of conservative kinetic equations on the torus.
10. Proscovia Namayanja, Flow in networks with sinks.
11. Valentina Parfenenkova, Feynman-Kac theorem in Hilbert spaces.
12. Minzilia A. Sagadeeva, An evolution operator for the nonstationary Sobolev type equation.
13. Georgy A. Sviridyuk, Degenerate operator groups in the optimal measurement theory.
14. Sophiya A. Zagrebina, The degenerate operator groups theory and multipoint initial-finish problem for Sobolev type equations.

## **9. Semigroups of operators in control theory (I. Lasiecka, R. Triggiani, J. Zabczyk)**

1. George Avalos, Concerning semigroups of fluid-structure PDE models.
2. Natalia A. Manakova, An optimal control over solutions of the initial-finish problem for one class of linear Sobolev type equations.
3. Irena Lasiecka, Global existence of solutions to a 3-D fluid structure interactions with moving interface.
4. Jerzy Zabczyk, Null controllable systems with vanishing energy.

## **10. Special classes of operators in Banach and Hilbert spaces (J. Janas)**

1. Joanna Blicharz, Unitary N-dilations for tuples of commuting matrices.
2. Zbigniew Burdak, On the decomposition and the model for commuting isometries.
3. Elżbieta Król, Properties of generalized Toeplitz operators.
4. Vladimir Müller, On joint numerical radius.
5. Artur Płaneta, Automorphisms of multidimensional spectral order.
6. Marek Ptak, On the reflexivity, hyperreflexivity and transitivity of Toeplitz operators.